

CLAIMS

What is claimed is:

1. (Canceled).

2. (Currently amended) ~~The method of claim 1~~ A method of measuring formation properties, the method comprising:

obtaining a first response signal from a first transmitter-receiver array of antenna elements

having magnetic dipoles oriented parallel to a tool axis;

obtaining a second response signal from a second transmitter-receiver array of elements

having magnetic dipoles oriented perpendicular to the tool axis;

combining the first and second response signals to obtain a combination response signal

having enhanced vertical resolution, wherein said combining includes:

performing a weighted summation of the first and second response signals, wherein

the ratio of the weight of the first response signal to the weight of the

second response signal is approximately minus three (-3).

3. (Currently amended) ~~The method of claim 1~~ 2, wherein the weighted summation is performed in accordance with the following equation:

$$Final\ Response = a \times VMD\ response - b \times HMD\ response ,$$

where VMD response represents the first response signal, HMD response represents the second response signal, and a and b are optimization parameters.

4. (Currently amended) The method of claim ~~1~~ 2, wherein the first transmitter-receiver array has antenna element placement substantially equal to antenna element placement of the second transmitter-receiver array.

5. (Original) The method of claim 4, wherein the antenna elements of the first and second transmitter-receiver arrays are appropriately-oriented coils of electrically-conductive material.

6. (Currently amended) The method of claim ~~1~~ 2, further comprising:
processing the combination response signal to determine a log of formation resistivity.

7. (Currently amended) The method of claim ~~1~~ 2, further comprising:
processing the first response signal to determine a first apparent formation conductivity;
processing the combination response signal to determine a second apparent formation conductivity; and
combining the first and second apparent formation conductivities to determine a formation anisotropy.

8. (Canceled).

9. (Currently amended) ~~The system of claim 8~~ A logging system that comprises:
a multiaxial induction tool configured to provide signals indicative of a vertical magnetic dipole (VMD) response and a horizontal magnetic dipole (HMD) response; and

a processor coupled to the multiaxial induction tool and configured to determine a combined response from the VMD and HMD responses, wherein the combined response has a substantially rectilinear vertical measurement profile, wherein the processor determines the combined response as a weighted sum of the VMD response and the HMD response, and wherein the relative weights of the VMD and HMD responses are approximately $3/2$ and $-1/2$, respectively.

10. (Currently amended) The system of claim 8 9, wherein the processor is further configured to determine a resistivity log of a formation from a combined response determined as the induction tool is moved through a borehole.

11. (Currently amended) The system of claim 8 9, wherein the multiaxial induction tool includes at least one transmitter triad and at least two receiver triads.

12. (Currently amended) The system of claim 8 9, wherein the processor is further configured to determine a formation resistivity anisotropy from the combined response and the VMD response.

13. (New) A method of measuring formation properties, the method comprising:

obtaining a first response signal from a first transmitter-receiver array of antenna elements
having magnetic dipoles oriented parallel to a tool axis;
obtaining a second response signal from a second transmitter-receiver array of elements
having magnetic dipoles oriented perpendicular to the tool axis;

combining the first and second response signals to obtain a combination response signal having enhanced vertical resolution, wherein said combining includes performing a weighted summation of the first and second response signals.

14. (New) The method of claim 13, wherein the weighted summation is performed in accordance with the following equation:

$$\text{Final Response} = a \times \text{VMD response} - b \times \text{HMD response},$$

where VMD response represents the first response signal, HMD represents the second response signal, and a and b are optimization parameters.

15. (New) The method of claim 13, further comprising processing the combination response signal to determine a log of formation resistivity.

16. (New) The method of claim 13, further comprising:

processing the first response signal to determine a first apparent formation conductivity;
processing the combination response signal to determine a second apparent formation conductivity; and
combining the first and second apparent formation conductivities to determine a formation anisotropy.

17. (New) A logging system that comprises:

a multiaxial induction tool configured to provide signals indicative of a vertical magnetic dipole (VMD) response and a horizontal magnetic dipole (HMD) response; and

a processor coupled to the multiaxial induction tool and configured to determine a combined response from the VMD and HMD responses, wherein the combined response has a substantially rectilinear vertical measurement profile, and wherein the processor determines the combined response as a weighted sum of the VMD and the HMD response.

18. (New) The system of claim 17, wherein the processor is further configured to determine a resistivity log of a formation from a combined response determined as the induction tool is moved through a borehole.

19. (New) The system of claim 17, wherein the multiaxial induction tool includes at least one transmitter triad and at least two receiver triads.

20. (New) The system of claim 17, wherein the processor is further configured to determine a formation resistivity anisotropy from the combined response and the VMD response.